STATINTL

To : [redacted]

From : [redacted]

Date : May 3, 1963

Subject : Seat Ejection and Parachute Tests

The slow speed ground ejection test program was completed on April 9, 1963; we are now ready to go into the F106 test program.

The ejection seat test program in the F106 will start the week of May 8, 1963 when we arrive at El Centro to modify the F106 for these tests. We plan to furnish the following hardware and help:

1. Ejection seats including all expendable ballistics.

2. Seat installation hardware in the F106 for at least four ejections. There will be no speed sensors used in these tests. Delays in seat separation will be predetermined and set.

3. Personnel to install seat in the F106 in cooperation with Air Force help at El Centro. This will require three mechanics from here, two structural and one armament for approximately four days.

4. An armament mechanic for the duration of the program, approximately six weeks.

5. Two engineers for the duration of the program for parachute, ejection seat preparation, and current analysis of the test results.

6. An instrumentation engineer for the first ground firing and for help only as required thereafter, one week's work.

In addition to providing the main flight test and scheduling for this test program, we are planning on the Air Force, El Centro, and Edwards facilities to furnish:

1. The instrumented dummies and their associated telementry.

2. All ground, ground to air, and air to air camera coverage, including documentary films and stills as requested.

3. The nets required for seat recovery from the ground firing.

We are planning on the Firewel Company to provide the following:

1. All test parachutes required complete with emergency oxygen.

2. Survival kits required in addition to that supplied for the telemetry package.

3. Pressure suits and other dummy apparel as required.

4. Seat, vent, and other disconnects for simulation of a complete production system for these tests.

As a result of the coordination meeting with Edwards and El Centro AFB personnel, the following schedule was determined for these F106 seat ejection tests:

Test #1 - May 16, 1963

A static ejection seat test will be conducted on the ground at El Centro. This test is primarily to be certain that no safety factor has been overlooked prior to conducting the inflight ejection seat tests. The recovery net at El Centro will be positioned relative to the F106 so that the seat and dummy will be recovered undamaged. The personnel parachute will be fully operational and an attempt will be made to recover the dummy with this parachute during the test. In addition to this, the seat recovery parachute which is actuated by a drogue gun will also be used.

This seat will be fired by remote control in the same manner as used on our sled tests.

Sufficient camera coverage will be furnished by Edwards AFB to verify the trajectory of the seat during this firing. This camera coverage can be a minimum since the seat trajectory is known from previous static tests. The predicted trajectory for this static test is shown on Figure 1, and should be used in positioning the F106 relative to the recovery net. This trajectory assumes that there is no operation of the seat recovery parachute.

Test #2 - June 4, 1963

The first flight test with the F106 will be conducted at mach . 9 and 20,000 feet. This test is to confirm the low altitude capability of the parachute system and the timers. The four second delay for seat separation will be used as installed on production systems. The seat trajectory expected on this test is shown on Figure 2.

The air to air camera coverage on this test will be provided by three T38 aircraft from Edwards AFB. A tentative location for these airplanes at the time of seat ejection is shown on Figure 3. The primary information required from this camera coverage is that of seat ejection and the first six seconds thereafter. Further camera coverage after this time is desirable and might be useful, but is not important to the successful completion of the test.

Ground to air coverage for this test will be provided by the "Big Eye" camera at El Centro. The primary use for this coverage is to ascertain dummy movements after the drogue and main parachute operations.

The instrumentation to be used on this test will be primarily installed in the dummy. Information on the drogue riser loads, the main riser loads, the dummy rotation both before and after seat separation and the dummy accelerations are desired. The instrumentation telemetering package will be packaged in a survival kit. The survival kit harness is to be modified so that there is absolutely no possibility of it separating from the dummy during any portion of this test.

Test #3 - June 11, 1963

This flight test will be conducted at Mach 1.55 and 50,000 feet. A seat to dummy separation time will be used on this test of one second. The purpose of this test is to have the seat separation and drogue operation occur under conditions which impose the highest air load ever expected upon ejection. The seat trajectory predicted for this test is shown on Figure 4.

The air to air camera coverage for this test will be provided by three F104D aircraft from Edwards AFB. As above, the critical camera coverage will be for the first six seconds during and after seat ejection. A tentative position for the three F104D aircraft relative to the F106 at the time of seat ejection is shown in Figure 5.

Ground to air coverage again will be with the "Big Eye" at El Centro. The requirements for camera coverage and instrumentation are the same as in Test #2 above.

Test #4 - June 18, 1963

This test will be conducted at Mach 1.82 and 46,000 feet altitude.

This will be a complete production seat and parachute system and will use the four second seat to dummy separation delay. A complete pressure suit and helmet will be used on the dummy during this test. The predicted trajectory for this test is shown on Figure 6.

The air to air camera coverage for this test again will be provided by three F104D aircraft from Edwards AFB. The tentative positioning of these aircraft during the test is the same as shown on Figure 5.

The camera coverage and instrumentation required are identical to those requirements for test #3 with the exception that additional instrumentation should be provided to monitor the operation of the pressure suit during ejection and let down on the parachutes.

Test #5 - June 25, 1963

This final test may or may not be conducted depending upon the results of the first three flight ejection tests. This test is intended to provide a maximum drop distance for the dummy on the drogue parachute. If the June 11, 1963 test conducted at 50,000 feet indicates that no problem exists with regard to dummy rotation during the descent on the drogue parachute, this test would be waived. If this test is conducted, it will be under the following conditions.

This seat ejection test will occur at whatever mach number is consistent with the maximum altitude that the F106 test aircraft can attain The seat and parachute system will be identical to that used in Test #4, and again the pressure suit will be used.

The air to air camera coverage for this test will probably be a minimum because of the difficulty of rendezvousing at high altitude for this purpose. One F106 school aircraft from Edwards AFB is to be used for camera coverage.

Since neither air to air or ground to air camera coverage will suffice for determining the dummy rotation during descent at high altitude, it is important on this test that the instrumentation for telemetering dummy rotation be used.

The above concludes the test schedule for the F106 tests. An overall plot of these tests is shown in Figure 9. It is realized that the use of three F104D aircraft for camera coverage may not always be possible.

Two F104D aircraft for camera coverage are considered sufficient for these tests and the positions that these would take in the event are shown in the Figure referred to above.

In order to properly schedule their activities, Edwards AFB must be advised of our firm current flight test schedules every Wednesday afternoon starting on May 29.

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We will arrive at El Centro AFB on Wednesday morning, May 8, 1963, to start modifying the F106 rear cockpit for these tests. [redacted] is our project engineer on these ejection tests. [redacted] will be the engineer at El Centro in charge of our work on this program. He is assisted by [redacted] for parachute and oxygen system maintenance.

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Best regards,

[redacted]

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kld

FIG. 1

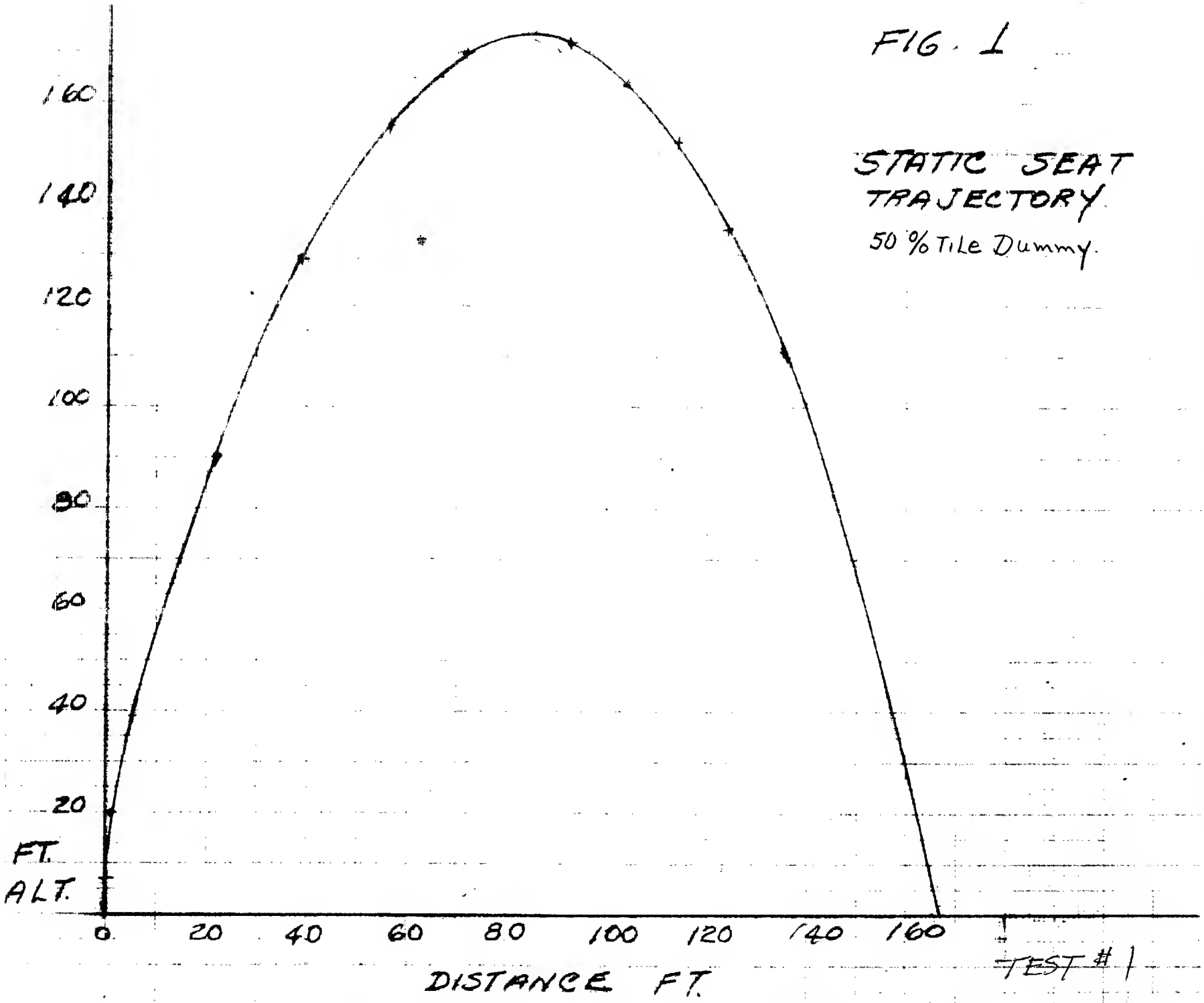


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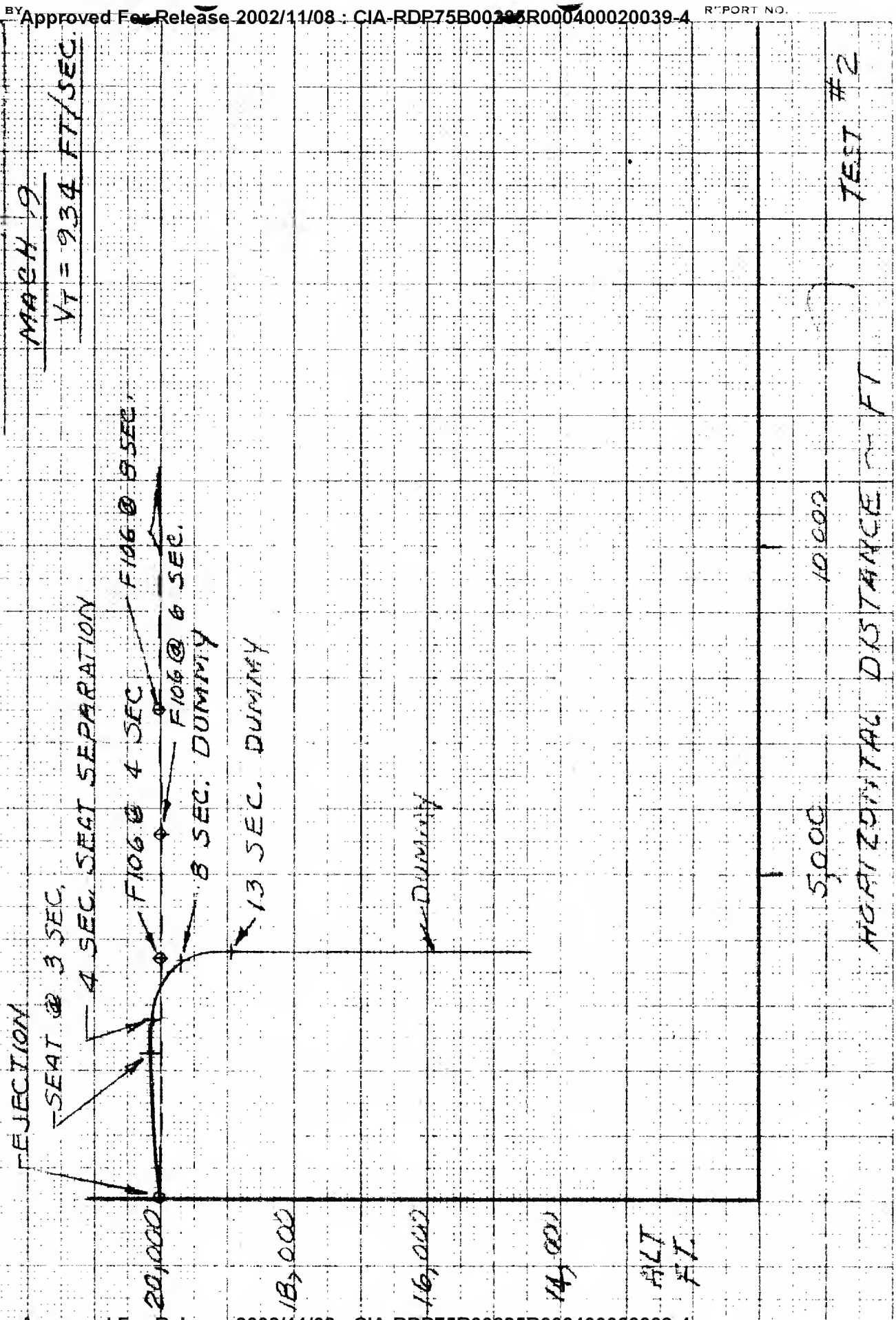
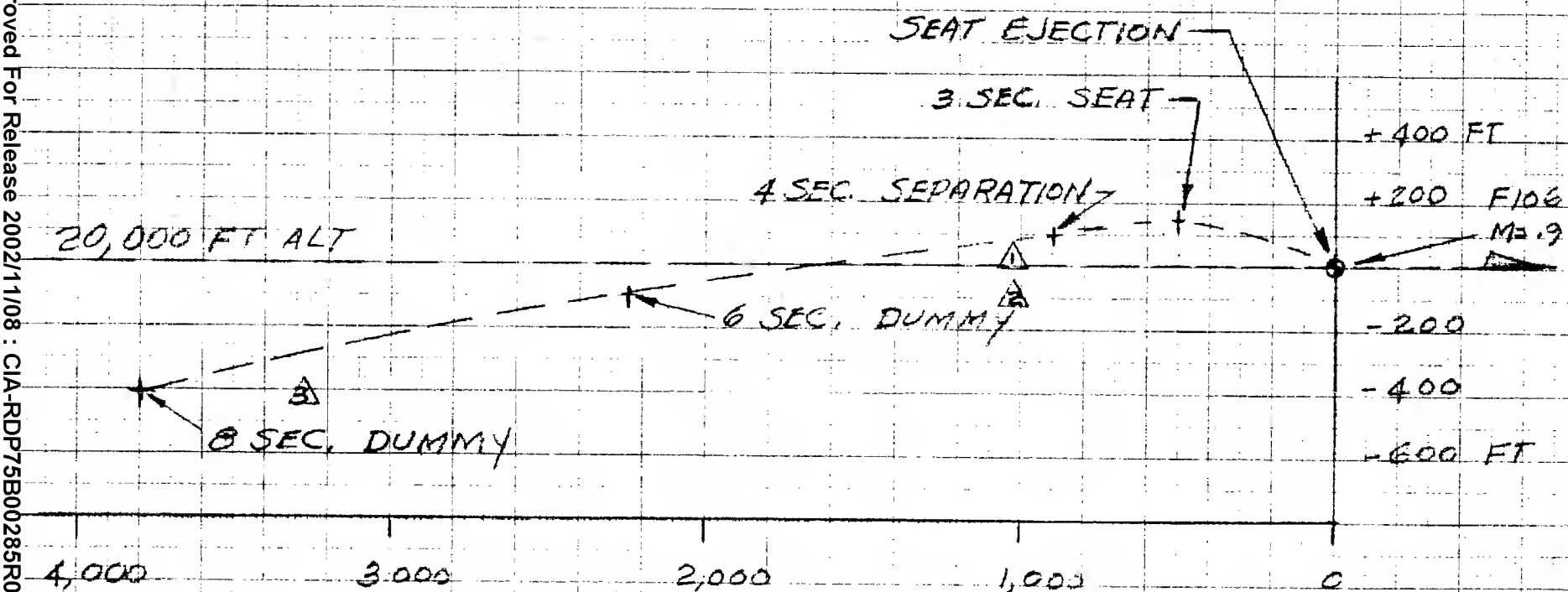
FIG. 2
SEAT-DUMMY TRAJECTORY
MACH 1.9
$V_T$ = 934 FT/SEC.



# FIG. 3
## PROPOSED CAMERA POSITIONS




● F106 WITH SEAT @ M = .9 @ 20,000 FT ALT HDG WEST

① 1ST PHOTO PLANE @ M = .9 SAFE DIST PORT SIDE

② 2ND PHOTO PLANE @ M = .9 SAFE DIST STARBOARD SIDE

③ 3RD PHOTO PLANE @ M = .9 SAFE DIST PORT SIDE

TEST # 2

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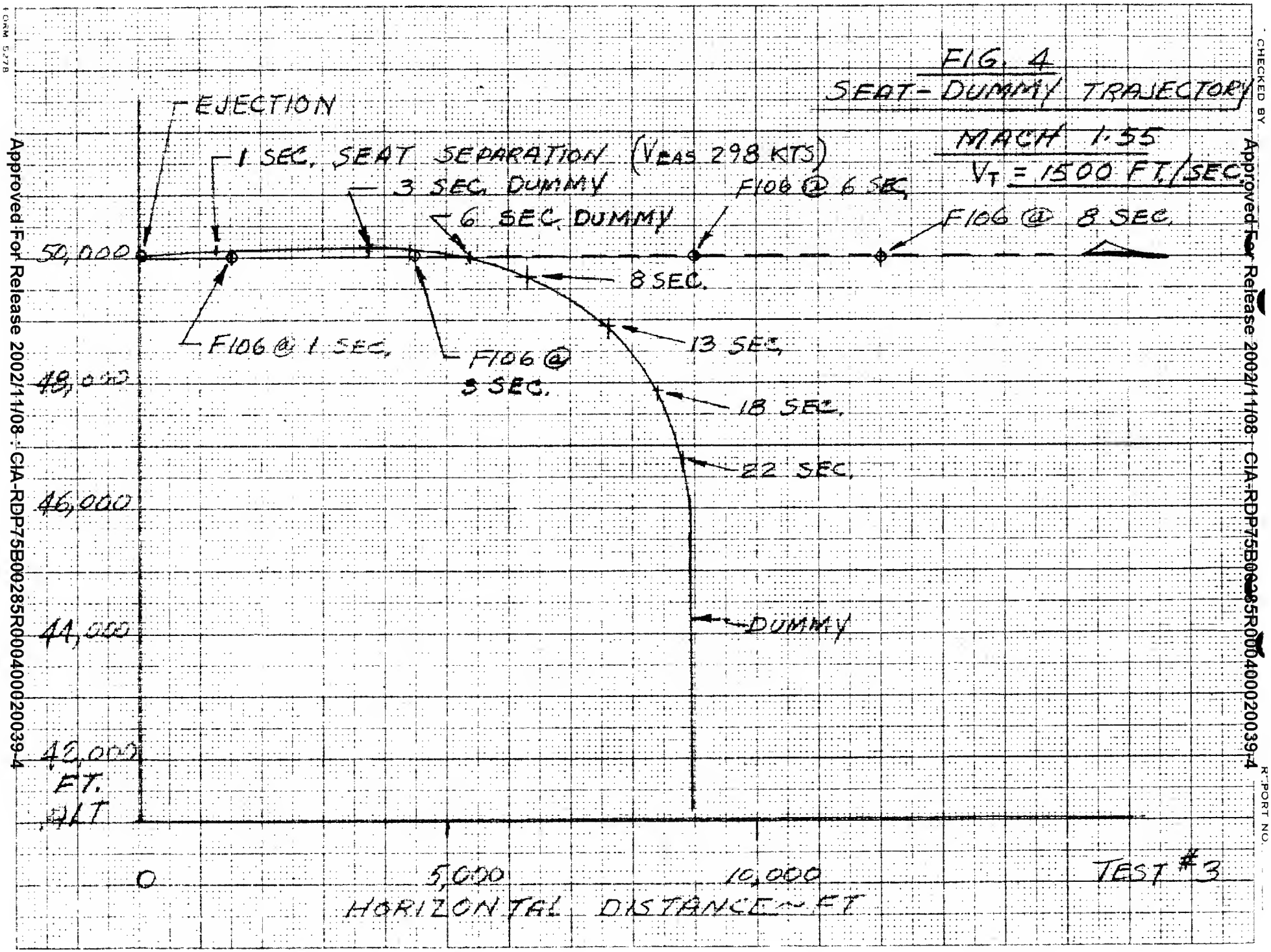


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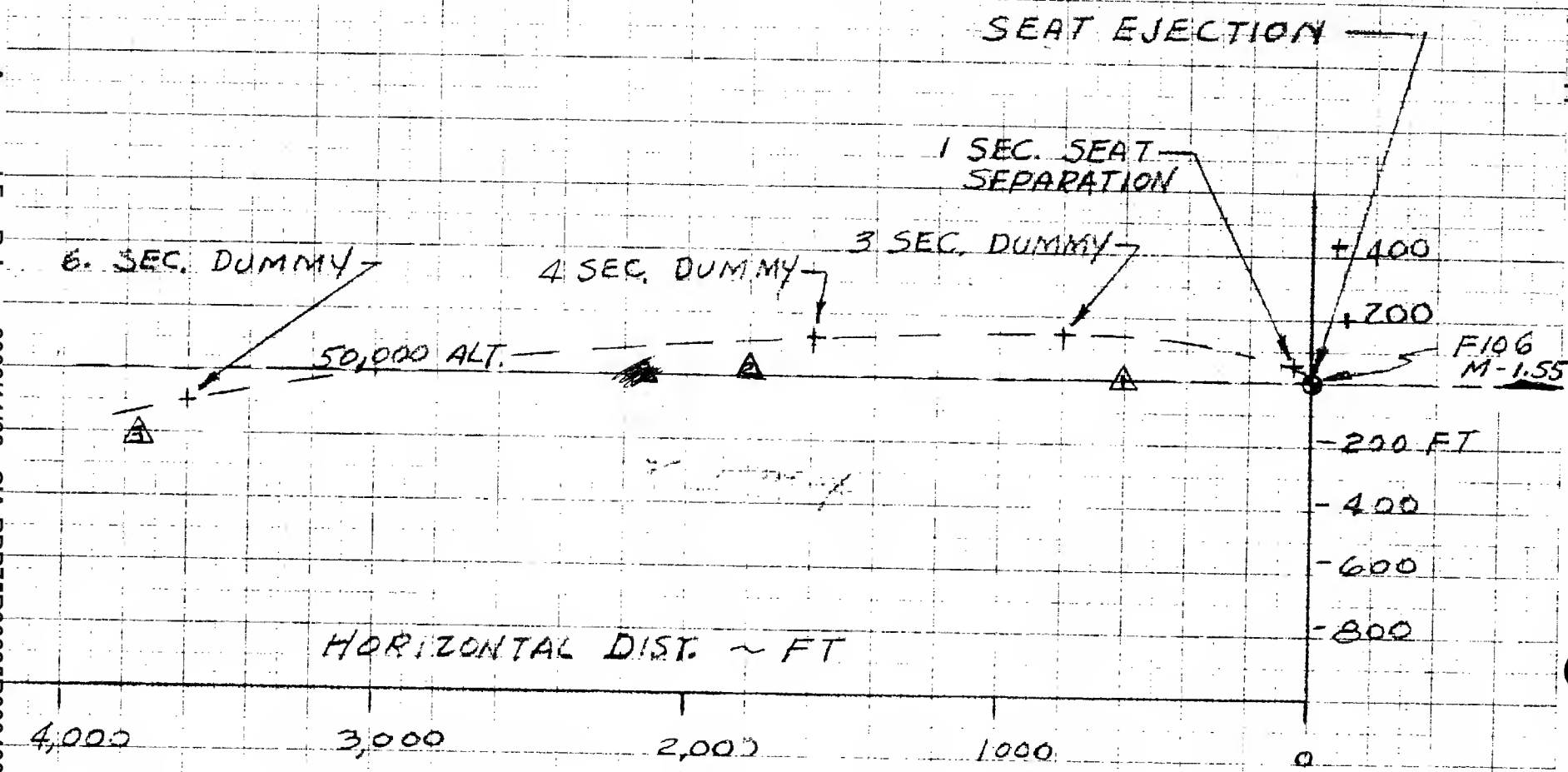
# FIG. 5
## PROPOSED CAMERA POSITIONS




● F106 WITH SEAT @ M = 1.55 @ 50,000 FT. ALT HDG WEST

① 1ST PHOTO PLANE @ M = 1.55 A SAFE DIST ON PORT SIDE

② 2ND PHOTO PLANE @ M = 1.55 A SAFE DIST ON PORT SIDE

③ 3RD PHOTO PLANE @ M = 1.55 A SAFE DIST ON STARBOARD

TEST # 3

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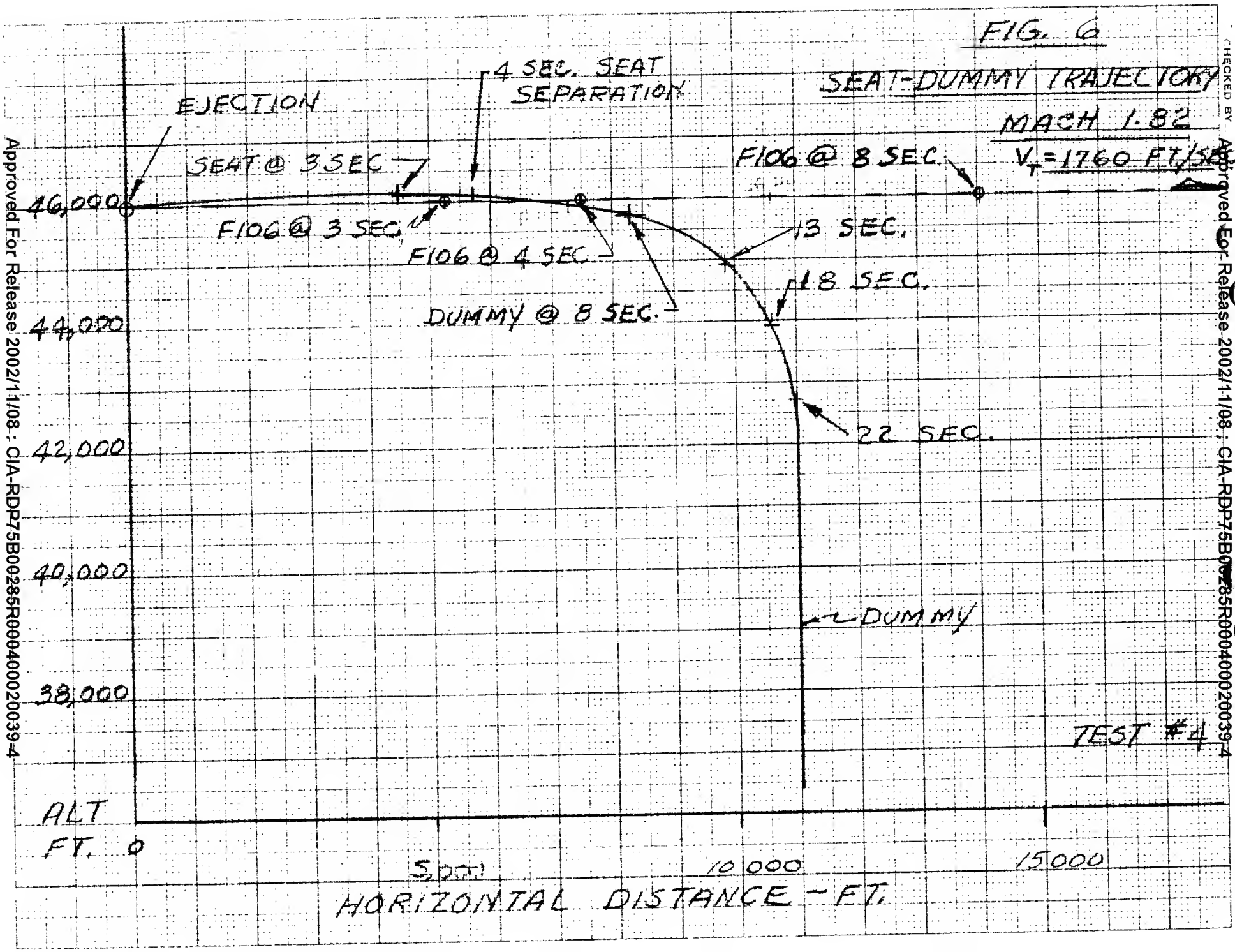
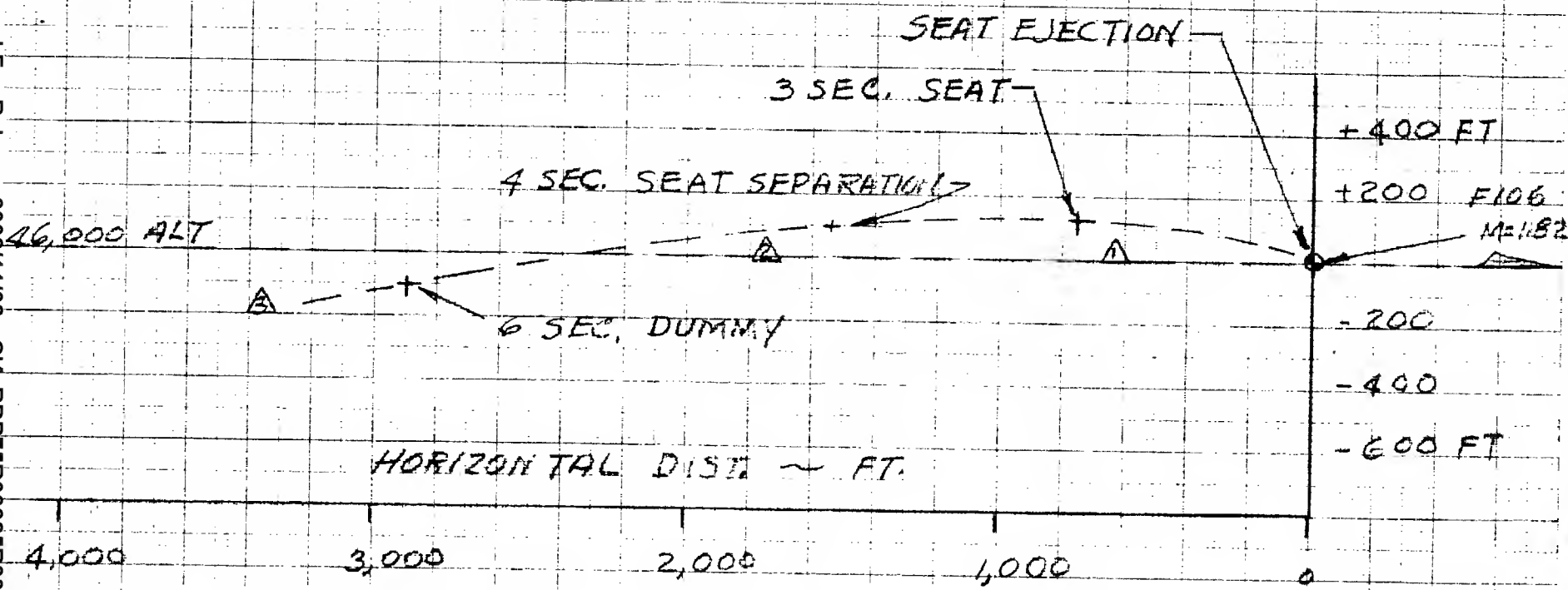


# FIG. 7

## PROPOSED CAMERA POSITIONS




● F106 WITH SEAT - DUMMY @ M = 1.82 @ 46,000 FT. ALT. HDG WEST

▲ 1ST PHOTO PLANE @ M = 1.82 SAFE DIST. PORT SIDE

▲ 2ND PHOTO PLANE @ M = 1.82 SAFE DIST. PORT SIDE

▲ 3RD PHOTO PLANE @ M = 1.82 SAFE DIST. STARBOARD SIDE

TEST # 4

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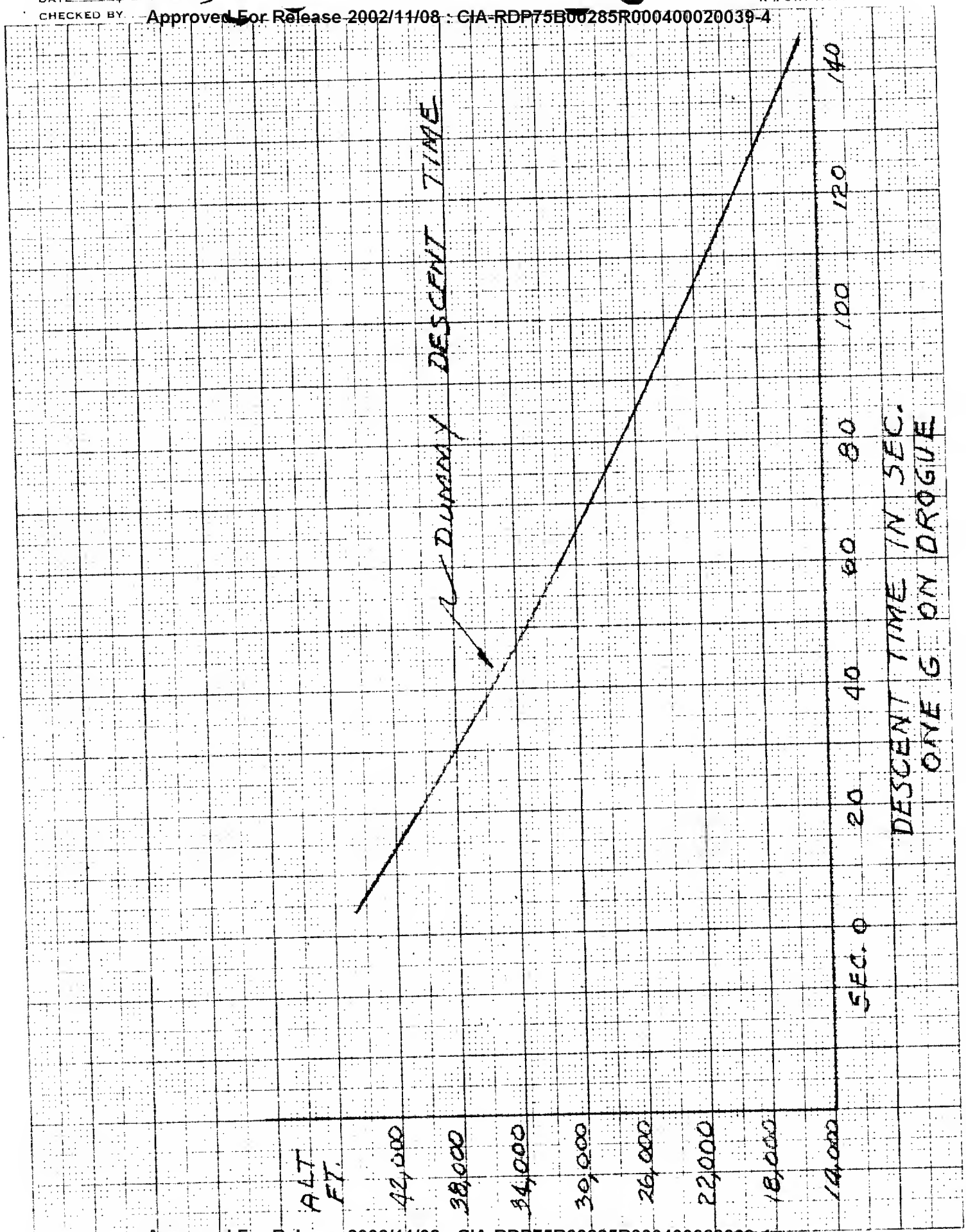
REPORT NO.





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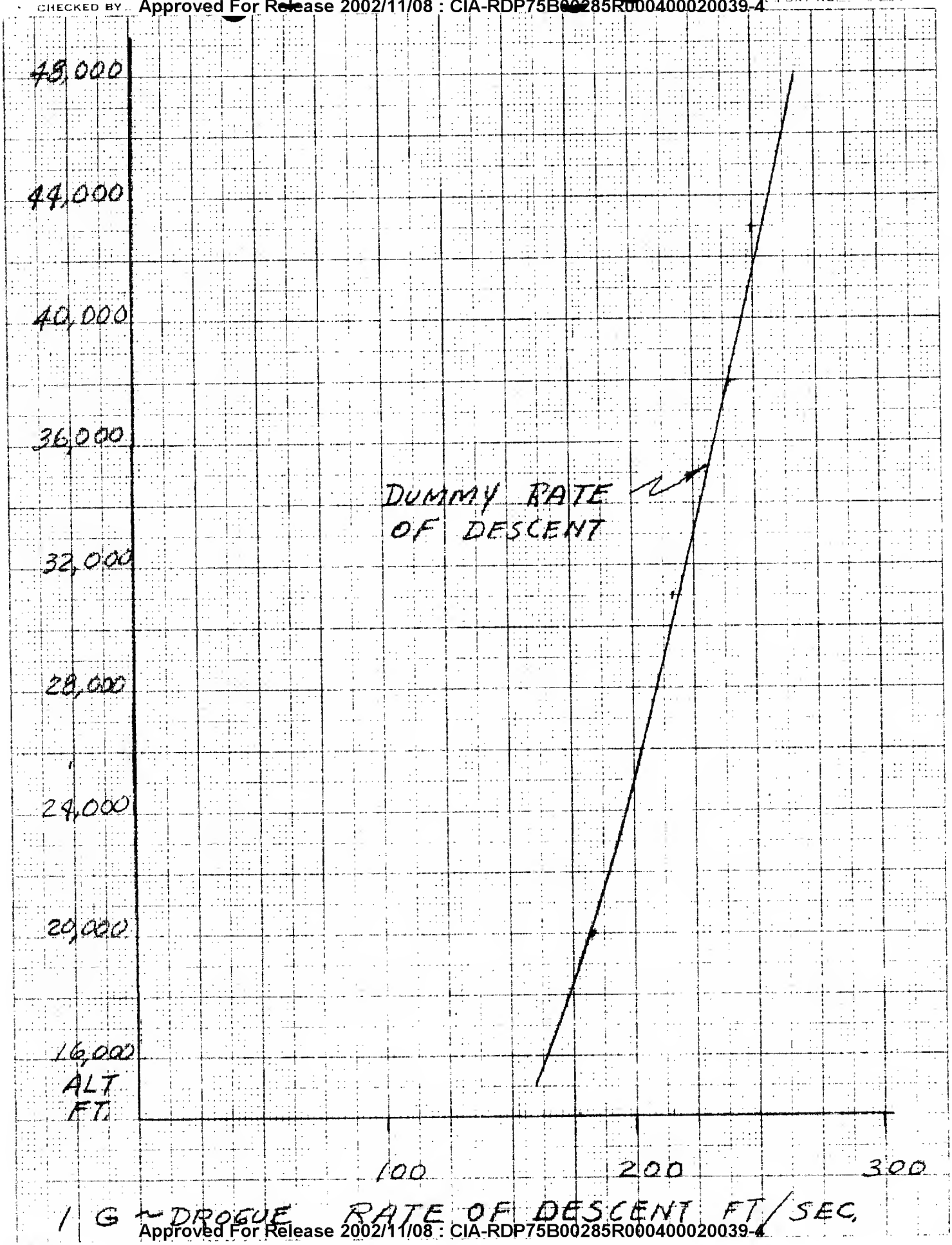


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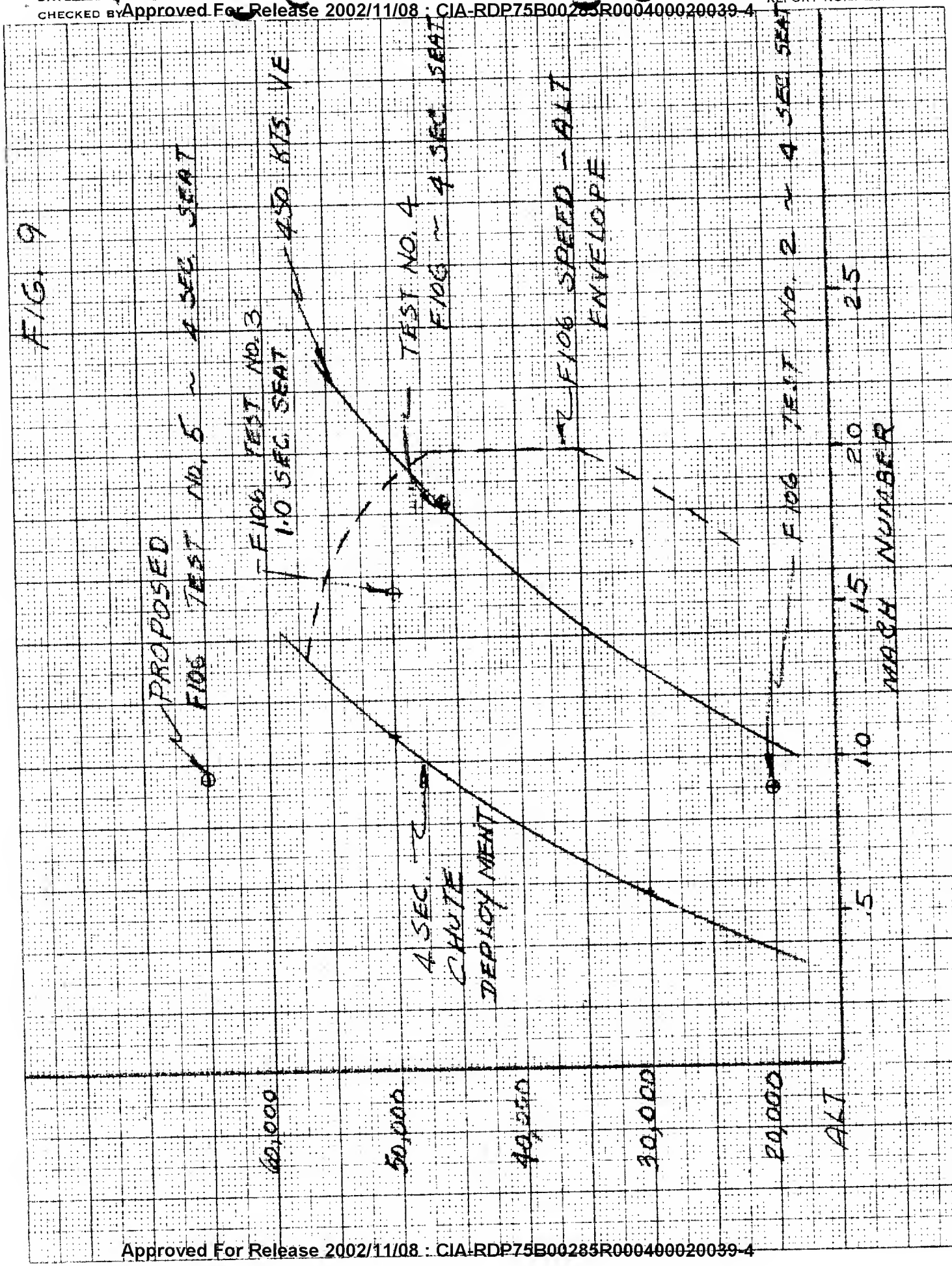




FORM 5278

Rate of Desent of 28ft Canopy with Live Jumper
V S.
Varibus Atmospheric Conditions At Sea Level
(Data For This Chart Extrac ted From T N. AI-13)

200-LB JUMPER
with Parachute Equipment

250-LB JUMPER
with Parachute Equipment